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ECONOMIC AND POLITICAL DETERMINANTS OF AGRICULTURAL AND FOOD PRICES: A CROSS-NATIONAL STUDY

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I. Introduction

The prices that farmers receive for their agricultural products and those paid by consumers for their food vary across countries as a result of both economic and political forces. The economic forces are primarily those that determine whether a country has comparative advantage in agriculture; the producer prices in agricultural exporting countries will tend to be below those of agricultural importers because of transport costs. The political forces determine where the burden of taxation lies and whether farmers are protected against international competition.

Recently internationally comparable data have become available on agricultural producer prices (FAO 1986), food prices for final consumers (Kravis, Heston and Summers 1982, UN 1986), and rates of agricultural protection (e.g. Schiff and Valdes 1992). The purpose of this paper is make a contribution to the explanation of the international variation in these three variables.

A number of interesting questions can be addressed with these data. First, is the conventional wisdom correct that the agricultural sector tends to be the victim of discrimination in less-developed countries and the beneficiary of government protection in more-developed countries? A recent study (Rao et al. 1990) has suggested that this piece of conventional wisdom is not supported by the FAO agricultural price data. More generally, does the evidence indicate that countries with comparative disadvantage in agriculture tend to protect their farmers more than countries

that are agricultural exporters? Second, do countries with comparative disadvantage in agriculture tend to have higher-than-average agricultural prices, even after correcting for the effects of agricultural protection? This is what one would expect on the basis of transport cost considerations. Third, can we explain the international variation in food prices and the gap between agricultural prices and food prices? The data show that the countries where farmers receive low prices for their agricultural goods are not necessarily the ones where consumers can buy food cheaply. We shall try to explain these variations in terms of the factor endowments of countries and the characteristics of countries that affect their proclivity to tax the food-producing sector.

The agricultural price level as used in this study is the ratio of a purchasing-power parity (pesos per dollar) to an exchange rate (pesos per dollar). The base country in the original data is the United States; thus an agricultural price level for a particular country of, say, 0.80, means that the prices received by agricultural producers, when converted from pesos to dollars by the exchange rate, are 80 per cent of those received by U.S. agricultural producers. The food price level is defined in an analogous manner; thus a food price level for a particular country of 0.80 means that the consumers in that country pay prices that are on average 80 per cent of those in the United States.

The next section presents a theoretical model that relates the agricultural price level to factor endowments and government protection of agriculture. Section III then explains the

hypotheses to be tested and the regressions to be run on the agricultural price level, the rates of nominal protection, and the gap between food prices and agricultural prices. The data and empirical procedures are described in Section IV and the results of the tests are presented in Section V. Concluding remarks are in Section VI.

II. A Model of the Agricultural Price Level

The agricultural price level as defined above is analogous to the national price level, which is the ratio of an economy-wide PPP to an exchange rate[1]. We begin by describing a model that has been used in the explanation of the national price level (Clague 1985). The model pictures a small economy trading with a single entity called the "Rest of the World". The economy contains three sectors, exportables, importables, and services or nontradeables. Each of the tradeable sectors has its own specific factor; labor is mobile across all three sectors and is the only factor in the service sector. In the basic theory of national price levels, it is assumed that there are no trade barriers and no transport costs. Hence the prices of tradeable goods are the same in the particular country and in the Rest of the World and it is only differences in the prices of services that give rise to international differences in national price levels. If agricultural goods are considered as tradeables, then clearly such a model cannot explain why

[1] References in the literature on national price levels include Kravis and Lipsey (1984), Officer (1989), and Falvey and Gemmell (1991).

agricultural price levels (agricultural PPP's deflated by exchange rates) differ across countries.

For the purposes of the present paper, the model is modified in several ways. First, transport costs are introduced to permit some international differences in the prices of tradeable goods. Second, in place of the two tradeable sectors (exportables and importables), the model will distinguish three broad tradeable sectors: agriculture, mining, and industry. Each sector is assumed to have its own specific factor: land in agriculture, mineral deposits in mining, and industrial capital in industry. Third, the model needs to account for the observed fact that countries normally export some agricultural products and import others. This adaptation in the model is made by disaggregating the agricultural sector into many products, and for simplicity it will be assumed that for each such product there is a distinct specific factor. (These may be thought of as distinct land-water-climate conditions.)

To illustrate the operation of the model, let us consider a graphical depiction of the labor market in the particular country. The length of the box on the left in Fig. 1 represents the entire labor force in the economy. The vertical axis is scaled in units of domestic currency and is used to measure the wage rate. The curve D_A is the demand curve for labor in agriculture, while the curve D_{MI} is the combined labor demand curve in mining and industry. These demand curves for labor in tradeable goods depend on the endowments of the relevant specific factors and on the world prices

of the various goods and the transport costs of the goods.

In the right-hand quadrant of Fig. 1 the curve S_{NT} represents the supply of labor to the nontradeable sector; it is derived simply as the horizontal distance at each wage rate between the D_{MI} and the D_A curves. The downward-sloping D_{NT} curve in Fig. 1 is the demand for nontradeables labor; the curve slopes downward because consumers buy more nontradeables as their price (the wage rate) falls.

Let the exchange rate be the numeraire and the wage rate be the variable that equilibrates the balance of payments. Taking the prices in the Rest of the World as given (the country in question is assumed to be "small"), let us show that the wage rate in the particular country will be higher, the greater the country's endowments of specific factors. The greater these endowments, the higher will be the demand curves for labor in the tradeable sectors and hence the lower will be the supply of labor to the nontradeables sector. The richer endowment of specific factors implies a higher level of real income, which also shifts up the demand curve for nontradeables, and consequently the wage rate (which is the price of nontradeables) unambiguously rises. This conclusion is familiar from the standard national price level model (Clague 1988): Resource-abundant countries will tend to have high national price levels. The present paper will focus on countries' relative endowments of land, mineral deposits, and industrial capital.

To bring out the implications of differences in relative

resource endowments, assume for the moment that all goods have the same transport costs between the particular country and the Rest of the World. A country that is well endowed with industrial capital and mineral deposits and poorly endowed with land will for obvious reasons import most of its agricultural consumption. Because imported goods will be more expensive and exported goods will be less expensive in the particular country than in the Rest of the World, this country will have a high agricultural price level. Conversely, a country well endowed with land and poorly endowed with mineral deposits and industrial capital will export most agricultural products and have a low agricultural price level.

The proposition just stated will now be formalized and generalized to allow for different transport costs for different goods. An expression is developed for the agricultural price level of the small country that is trading with the Rest of the World. There are many agricultural products, which are indexed by i = 1,...I. The units of quantity are defined such that the "world price" of each agricultural good is equal to unity. The exchange rate is also set equal to unity for convenience.

Let us divide the country's agricultural products into three categories: export goods, goods not actually traded internationally, and imported goods. Define the transport cost between the particular country and the Rest of the World on good i as t_i. Clearly the domestic prices of export goods in the particular country will be below unity, and those of imported goods will be above unity. The prices of goods not actually traded will

lie within the bounds given by transport costs in either direction (which are assumed to be equal). More precisely, the price of an export good will be $1 - t_i$, that for an imported good will be $1 + t_i$, and that for a good not actually traded must lie between $1 - t_i$ and $1 + t_i$. Let X_i be the domestic production of good i, and p_i the domestic price. Since the world prices are all unity, the agricultural price level in the country is

$$APL = \Sigma p_i X_i / \Sigma X_i$$

Let us denote the export goods by $i = 1,...I_1$, the goods not actually traded by $i = I_1+1,...I_2$, and the imported goods by $i = I_2+1,...I$. Thus we have

$$APL = \{\sum_{i=1}^{I_1} (1-t_i) X_i + \sum_{i=I_1+1}^{I_2} p_i X_i + \sum_{i=I_2+1}^{I} (1+t_i) X_i\} / \Sigma X_i \qquad (1)$$

Equation (1) gives a precise expression for the agricultural price level in terms of the domestic production shares and the international transport costs of the various commodities. Before commenting on the role of these variables, let us show how the conclusion established above, that an increase in a country's endowment of mineral resources and industrial capital will raise its APL, can be seen to hold in equation (1). The conclusion follows from the fact that an increased endowment of these resources raises the wage rate. A higher wage rate pulls goods into the import category from the not-traded category and pushes goods out of the export category into the not-traded category. In other words, it reduces the value of I_1 and I_2. Equation (1) shows

that these changes in I_1 and I_2 raise APL. The higher wage also raises the cost of production and the price of not-traded goods (those indexed from $I_1 + 1$ to I_2), reinforcing the changes in I_1 and I_2.

However, the APL does not depend only on resource endowments, nor on the trade patterns determined by resource endowments. It is possible for a country to have a low APL despite having a large import surplus of agricultural goods. Recall that in (1) the prices are weighted by the domestic production quantities. Suppose a land-poor country with an agricultural import surplus did not produce any of the agricultural goods that it imported. Suppose further that domestic agricultural production was concentrated in some goods that were exported subject to heavy transport costs. For such a country the APL would be low, despite its poor land endowment and its agricultural import surplus. This curious result shows that even at the theoretical level, there is not a perfect negative matching across countries or over time of the agricultural price level and the agricultural trade balance. However, in the empirical analysis it seems reasonable to assume that the peculiar conditions required for this curious result are not commonly present and that, data problems aside, it is to be expected that the agricultural price level and the agricultural trade balance will be strongly (but not perfectly) negatively correlated in a sample of countries.

The agricultural price level will also be affected by government policies that protect or discriminate against

agriculture. The theory of national price levels suggests that import tariffs and other barriers to imports and export subsidies raise the national price level, while export tariffs reduce it (Clague 1986). The same logic applies to the agricultural price level. The role of man-made barriers and subsidies can be illustrated in equation (1). Suppose that transport costs are zero. Let the t_i refer to export taxes and import taxes on the various products. Export subsidies are interpreted as negative export taxes. Quantitative restrictions on imports must be converted to equivalent import tariffs. Let us note first that import tariffs (or equivalent import quotas) and export subsidies raise the equilibrium wage rate. This conclusion follows because these measures shift up the D_A curve in Fig. 1, while they do not alter the D_{MI} and D_{NT} curves. The rise in the wage rate shifts up the costs and hence the prices of agricultural goods in the not traded category. At the same time, the imposition of import barriers and export subsidies raises the prices of the affected goods in the exported and import-competing categories. In the final equilibrium, it is clear that the APL will be higher, the greater the positive t_i on the imported goods and the greater in absolute value the negative t_i on the exported goods. Conversely, the APL will be lower, the greater the positive t_i on the exported goods.

III. Specification of Hypotheses

This section describes the statistical tests to be run. In

brief outline, the theory of the previous section says that the agricultural price level is explained by the agricultural trade balance and by rates of protection. To avoid problems of reverse causation, rather than using the agricultural trade balance itself, we use the determinants of the agricultural trade balance, namely real income, population density, and the mineral share (as described in subsection A). Next, in subsection B, we explain the rationale for a regression of the level of agricultural protection on the determinants of the agricultural trade balance. Finally, in subsection C, we explain the rationale for regressing the food price level and the gap between agricultural and food price levels on real income, population density, and the mineral share.

A. Regressions of the Agricultural Price Level

The model suggests that government interventions in agricultural markets are one determinant of the agricultural price level. Since the agricultural price level is also determined by the agricultural trade balance according to the model, the determinants of this trade balance need to be specified. The agricultural trade balance is measured by the net normalized exports of agricultural products, or NNX, which equals (X-M)/(X+M), where X and M refer to exports and imports of agricultural products. This trade balance is strongly affected by the country's endowment of land resources relative to other factors of production. Measures of factor endowments are population density per unit of agricultural land (DENS), the share of mining in GDP

(MINS, for mineral share), and real income (RELY), which reflects accumulations of physical and human capital and technological level. These are determinants of NNX_1, or what the agricultural trade balance would be in the absence of government interventions, as shown in (2),

$$NNX_1 = a + b\,RELY + c\,DENS + d\,MINS + \epsilon_1 \qquad (2)$$

where ϵ_1 is an error term. The actual trade balance is affected by government interventions that change the prices faced by consumers and producers of agricultural products. These price changes will be denoted PCD and PPD for consumer prices and producer prices respectively. The actual trade balance is then

$$NNX = NNX_1 + e\,PDC + f\,PPD + \epsilon_2 \qquad (3)$$

The agricultural price level APL, which is an index of producer prices, is determined by the intervention-free trade balance (NNX_1) and the government-induced change in producer prices (PPD).

$$APL = g + h\,NNX_1 + i\,PPD + \epsilon_3 \qquad (4)$$

where the coefficient i is presumably close to unity. Since NNX_1 is not observable, we substitute (2) into (4) to obtain

$$APL = k+l\,RELY + m\,DENS + n\,MINS + o\,PPD + \epsilon_5 \qquad (5)$$

This is the main test of the model. In this equation we treat the independent variables as exogenous. Population density is determined by historical patterns of land settlement and past

population growth. The mineral share in GDP is determined largely by endowments of mineral resources and government policies that have influenced their exploitation. Real income is determined by factor endowments, institutions and policies (Olson 1993). (To be sure, APL may reflect agricultural support policies which have some effect on real income, but this must account for a very small part of the enormous income differences among countries in the sample.)

B. Regressions of Agricultural Protection

A pattern that has been frequently noted in the literature is that the agricultural sector tends to be the beneficiary of government protection in rich countries and the victim of policy discrimination in poor countries. The phenomenon has been explained in terms of the theory of collective action by the differential ability of farmers to organize and to press governments for benefits (Olson 1984, Anderson and Hayami 1986, Bautista and Valdes 1993). In poor countries the difficulties of transportation and communication, along with the illiteracy of most farmers and the lack of democratic institutions, prevent them from effectively pressuring governments. In rich countries, on the other hand, the same factors, along with over-representation of rural interests in legislatures, make farmers an extremely effective special interest group.

Apart from real income, another variable that can be hypothesized to affect a country's level of agricultural protection is the country's comparative advantage or disadvantage in

agriculture. In light of the rational ignorance of voters, it would seem to be easier for producers to extract resources from the rest of the economy by pushing for barriers to imports than by attempting to obtain explicit subsidies from the government budget.

These considerations suggest regressing the nominal protection rates on real income, the mineral share, and population density. The latter two variables are determinants of the agricultural trade balance.

C. Food Prices, Agricultural Prices, and the Gap Between Them

The difference or gap between the agricultural prices received by farmers and the food prices paid by consumers should be related to the real costs of transforming farm products into food and to government policies with respect to prices and the location of the burden of taxation. With regard to the real costs, it may be hypothesized that more densely populated countries have lower costs of collecting farm products, processing them, and distributing food to consumers.

The effect of real income on the real costs is not obvious, since it is not clear how real income affects comparative advantage in food processing and distribution. However, real income is likely to enter positively in a food price regression because quality differences in food products are probably not fully taken into account in the ICP price comparisons. These quality differences are probably smaller for agricultural products than for food products and hence this quality problem will tend to make for

a positive income coefficient in the price gap equation as well.

With regard to government policy, a large price level gap indicates that the government is placing a relatively heavy burden on the farm and food sector of the economy. In countries where the mineral share is large, that sector makes a natural target for taxation and hence the rate of taxation on food production and consumption would be correspondingly lower.

These considerations suggest that in a regression of the price level gap, real income should enter with a positive sign and the mineral share and population density should enter with negative signs.

IV. Description of the Data and Empirical Procedures

A. Agricultural Price Levels

The agricultural price levels for 1980 are taken from FAO (1986). This source provides Geary-Khamis (Geary, 1958; Khamis, 1970, 1972) indexes of agricultural PPP's. The GK system starts from the category-level prices (e.g. pesos per ton) of each country and it calculates simultaneously the world category prices and each country's overall agricultural PPP (relative to the numeraire currency, the U.S. dollar). This PPP may be interpreted as the cost in domestic currency of a bundle of goods that cost one dollar at international prices. The weights in this bundle are the quantities of domestic production of the various goods in the particular country (FAO, 1986, p. 21).

The official exchange rates are provided in the FAO

publication. The black market rates are taken from World Bank (1991). The original source is the World Currency Yearbook. The aggregate PPP data, available for 60 benchmark countries in 1980, are from UN (1986). There are 51 countries with data from both the FAO and this UN source[2]. The agricultural price levels and the food price levels have each been normalized so that the mean of the 51-country sample is equal to 1.00.

B. Independent Variables

The real income variable (RELY) is income per capita relative to the United States converted at PPP rather than at the exchange rate. It is taken from Summers and Heston (1988).

The agricultural trade balance (NNX) is taken from the FAO Trade Yearbook. The mineral share in GDP (MINS) is taken from World Tables, and refers to the years 1970-81. Four countries (Mali, Senegal, Costa Rica, and Israel) do not separate mining from the rest of industry; in these cases the mineral share was set equal to 0.5%.

Population density was measured in several different ways. Total population was divided by (1) total land area of the country, (2) arable plus permanent crop land plus pasture land, or (3) arable plus permanent crop land. The results were quite similar for definitions (2) and (3); the results were somewhat poorer for the first definition, as might be expected, since this definition

[2] The Penn World Tables (Summers and Heston, 1991) provide short-cut estimates of PPP's for nonbenchmark countries, but these are regarded as much less reliable than the benchmark estimates.

makes no allowance for land quality. The variable used in the results shown here was population divided by the sum of arable plus permanent crop land and one-half of pasture land.[3] The data were taken from the FAO Production Yearbook.

Nominal tariff protection was taken from several different sources. Schiff and Valdes (1992) provide nominal protection rates for eighteen LDCs. Anderson and Hayami (1986) provide rates of nominal protection fifteen industrial countries. Data for many of the same industrial countries and some additional ones are in OECD (1986)[4]. The two sources are quite consistent (see tables in the data appendix). The two sources were merged by taking the average of the two figures, or where only one source provided a figure, taking that figure. Finally, Webb et al. (1990) provide figures for many countries, starting in 1982. These figures are not ideal, since all the other data are for 1980. However, data could be added from this source for eight countries that were not available elsewhere.

We have nominal protection data for 42 countries (34 if the Webb et al. figures are not used). These countries are used for the regressions presented next.

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[3] To facilitate comparison of different density measures (see unpublished data appendix), the variable is measured in standardized form, that is, in units of standard deviation from the mean.

[4] The OECD study of government intervention in agriculture provides figures for "price intervention" and for "value of production". The ratio of these is taken as the rate of nominal protection. The figures match up quite well with the nominal protection figures in Anderson and Hayami.

V. Results of the Tests

A. Agricultural Price Levels and Nominal Protection Rates

Table 1 presents some regressions of equation (5). In this table the agricultural price level is defined using the black market exchange rate, but the results using the official exchange rate are similar. The table presents the results for six different protection variables. These six variables were constructed by combining the data from the four sources in different ways, as specified in the notes to the table and in the data appendix. The main reason for the variation in the regression coefficients is not that the different sources for nominal protection give different estimates but that the sample composition changes as data are added from different sources.

The results are quite consistent that the agricultural price level is positively related to the protection variable (whichever one is used) and to population density. The coefficient on the protection variable is generally not too far below its theoretical value of unity. The coefficient on the mineral share is quite sensitive to the sample composition; this occurs because the results for this variable are largely determined by the few countries with very large mineral shares. In any case the mineral share always comes in positively and with a respectable t-ratio. The coefficient on real income is generally small and not statistically significant.

These results are consistent with the model presented above. As expected the protection variables, measuring the effect of

government intervention on producer prices, are strongly related to the agricultural price level. But after correcting for the effect of protection, the determinants of the agricultural trade balance, namely the mineral share and population density, are positively related to the agricultural price level. These results indicate that transport costs affect the price level in the manner indicated by the model.

The justification for the regressions in table 1 included the assumption that the agricultural trade balance is related to the three independent variables. Confirmation of this relationship is provided by the last regression in table 2, which shows that this trade balance is positively related to real income and density, and negatively related to the mineral share.

The next question concerns the determinants of the protection variables. Table 2 presents the regressions of GOVINT4 and GOVINT5, which are two of the protection variables defined in the notes to table 1. In these regressions real income is strongly positively related to nominal protection, as has been found repeatedly in the literature (e.g. Anderson and Hayami 1986). A new result is that population density, which is a determinant of comparative advantage in agriculture, is also positively related to protection. This result is consistent with the political economy hypothesis described above. The hypothesis that a large mineral share would be accompanied by high agricultural protection is not supported by these regressions.

B. Agricultural Prices, Food Prices, and the Gap Between Them

This section makes use of the sample of 51 countries with data from both the FAO and the ICP. Protection data are not available for all the countries in this sample and the protection variables are not used in this section.

Table 3 presents regressions of the agricultural price level, the food price level, and the gap between them. The top panel uses the official exchange rate and the second panel uses the black market rate.

We first note that in the absence of a nominal protection variable, real income and population density have larger and more highly significant coefficients in the regression. We know from table 2 that these two variables are positively related to the rate of protection. Thus it is clear that their coefficients in table 3 are partly reflecting the influence of protection.

While agricultural prices are strongly related to the mineral share and to population density, food prices are not. They are determined primarily by real income. As mentioned in the theoretical section, this result may partly reflect a quality bias in the measurement of food prices.

The gap between agricultural and food prices is negatively related to density and to the mineral share. These results are consistent with the hypotheses described above.

The bottom panel in table 3 contains a regression of the agricultural price level defined using the GDP purchasing-power parity (PPP) instead of an exchange rate in the denominator. In

this regression density and the mineral share enter positively as before, but real income now enters with a negative rather than a positive sign. This negative association has been interpreted by Rao et al. (1990) as throwing doubt on the conventional wisdom that the agricultural sector is a victim of policy discrimination in LDCs. The evidence provided by this negative association is not very persuasive, however, because it has many other interpretations than the one based on government policy. In particular, it is well known that service prices are much lower in poor than in rich countries and this phenomenon may explain a good part of the negative association described by this regression. All of the regressions in this paper are consistent with the conventional wisdom about policy discrimination against agriculture in less-developed countries.

VI. Conclusions

The theoretical model of the agricultural price level suggested that transport cost considerations would tend to make the level higher in countries with comparative disadvantage in agriculture than in countries with comparative advantage in agriculture. The price level was also predicted to be higher in countries with higher levels of nominal protection. These predictions were supported by regressions of the agricultural price level on real income, nominal protection, and two determinants of comparative advantage in agriculture, namely the mineral share and population density.

Rates of nominal protection were found to be positively related to real income (as is familiar in the literature) and positively related to population density (a more novel result). This latter result is consistent with political economy considerations based on the ability of an interest group to extract resources without making the process transparent to the public.

The gap between food prices to consumers and agricultural prices to producers was found to be positively related to real income and negatively related to density and to the mineral share. These results are consistent with hypotheses based on the real costs of collecting, processing, and distributing food and on the ease of taxing mineral resources.

Finally, the FAO and the ICP data sets appear to offer a fertile field for the analysis of economic and political phenomena. This paper has explored only a small part of this field, as it has been confined to analysis of very aggregated data, but both sources are extremely rich in commodity detail. Many political and economic theories have implications that could be tested with these data.

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Figure 1

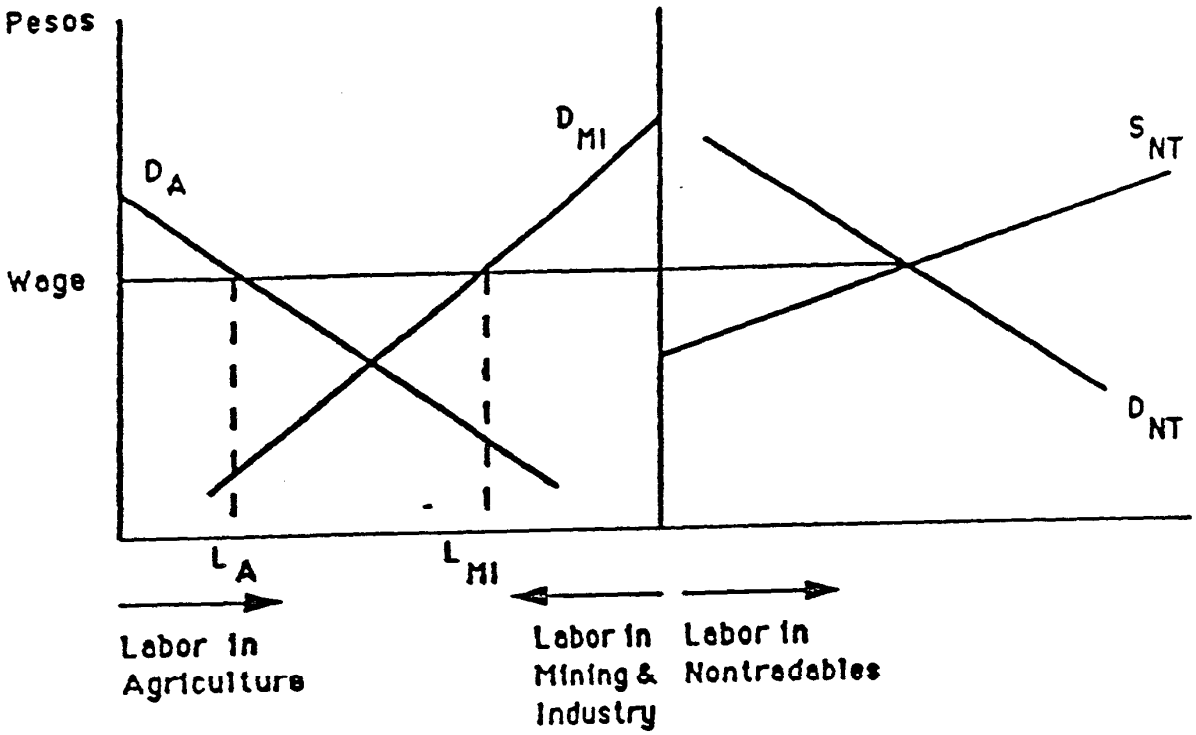
Pesos
Wage
D_A
D_{MI}
S_{NT}
D_{NT}
L_A
L_{MI}
Labor in Agriculture
Labor in Mining & Industry
Labor in Nontradables

Table 1. Regressions of Agricultural Price Level
(Using Black Market Exchange Rate)

Inter-cept	Real Income	Mineral Share	Populat Density	Protect Variable	No. of Observ	R-sq. (SEE)
0.697 (7.19)	0.393 (2.28)	1.864 (2.18)	0.0906 (2.10)	0.574[1] (3.00)	32	.6332 (.2552)
0.848 (7.77)	0.191 (0.89)	1.720 (1.69)	0.0711 (1.44)	0.666[2] (2.77)	39	.4673 (.3091)
0.838 (7.06)	-0.110 (-0.49)	8.337 (3.45)	0.1204 (2.75)	0.822[3] (3.47)	32	.5988 (.2744)
0.837 (5.84)	0.036 (0.13)	7.266 (2.48)	0.1050 (2.22)	0.759[4] (3.53)	27	.6313 (.2879)
0.844 (7.58)	-0.124 (-0.59)	8.290 (3.59)	0.1175 (2.93)	0.854[5] (4.51)	34	.6469 (.2650)
0.864 (8.64)	0.122 (0.61)	1.700 (1.83)	0.0918 (2.28)	0.718[6] (3.87)	42	.5516 (.2901)

[1] TARIWEB (from Webb et al.)

[2] GOVINT (average of TARIWEB and SCHIFF)

[3] GOVINT2 (average of SCHIFF and OECD)

[4] GOVINT3 (average of SCHIFF and ANDERSON-HAYAMI)

[5] GOVINT4 (SCHIFF, supplemented by OECD and ANDERSON-HAYAMI)

[6] GOVINT5 (GOVINT4 supplemented by TARIWEB)

Table 2. Regressions of Protection and of Agricultural Trade Balance

Depend. Variable	Inter-cept	Real Income	Mineral Share	Pop. Density	No. Obs.	R-sq. (SEE)
GOVINT4[1]	-0.209 (-2.08)	0.790 (5.60)	-1.677 (-0.76)	0.0950 (2.75)	34	.5356 (.2555)
GOVINT5[2]	-0.245 (-3.15)	0.762 (6.08)	1.020 (1.28)	0.0934 (2.94)	42	.4983 (.2535)
Agric. Trade Balance	0.473 (4.97)	-0.560 (-2.90)	-3.400 (-3.54)	-0.1660 (-3.23)	51	.3575 (.3889)

[1] See note 5 in table 1.

[2] See note 6 in table 1.

Table 3. Agricultural Price, Food Prices, and the Gap Between Them (Sample of 51 Countries)

Panel A: Price Levels Using Official Exchange Rates

Dependent Variable	Inter-cept	Real Income	Mineral Share	Pop. Density	R-sq. (SEE)
Agric. Price	0.809 (12.63)	0.323 (2.48)	1.982 (3.06)	0.1804 (5.21)	.4536 (.2619)
Food Price	0.769 (11.52)	0.640 (4.72)	0.407 (0.60)	0.0248 (0.69)	.3100 (.2731)
Gap	-0.040 (-0.65)	0.317 (2.51)	-1.576 (-2.51)	-0.1556 (-4.63)	.3495 (.2542)

Panel B: Price Levels Using Black Market Exchange Rates

Agric. Price	0.744 (10.43)	0.5812 (4.01)	1.385 (1.92)	0.1839 (4.77)	.4822 (.2917)
Food Price	0.689 (9.46)	0.931 (6.30)	-0.058 (-0.08)	0.0239 (0.61)	.4602 (.2976)
Gap	-0.055 (-0.86)	0.350 (2.68)	-1.443 (-2.22)	-0.1600 (-4.60)	.3416 (.2631)

Panel C: Agricultural Price Level Using GDP PPP

Agric. Price	2.044 (14.87)	-1.108 (-3.97)	2.384 (1.72)	0.3661 (4.92)	.4027 (.5621)

APPENDIX TO:ECONOMIC AND POLITICAL DETERMINANTS OF AGRICULTURAL AND FOOD PRICES: A CROSS-NATIONAL STUDY by Christopher Clague August 1993

I. Pages 1 and 2 of this appendix list the area and population data that went into the calculation of population density. The mineral share data in that table were not the ones used in the final paper.

II. The next four pages provide information about the protection variables, as described below.

III. The last two pages provide the average price level APL (using official exchange rate), and APN (using black market rate), and real income, the mineral share.

TARIWEB is from Webb et al. 1990.. From the source "Price PSE" was calculated as "Price Intervention" divided by "Value of Production". The tariff equivalent was calculated as TARIWEB = PSE/(1.0-PSE). The data are for 1982 for 32 countries in our sample.

SCHI80 is the nominal protection rate from Schiff et al. for 1980. SCHI7981 was also calculated for the years 1979-81 but not used. The data are for 16 countries in our sample.

TARIFF is from OECD 1986, p. 124. PSE is calculated as the market price support as a proportion of the market price; these were converted to tariff equivalents by the formula TARIFF= PSE/(1.0- PSE). The data are for 16 OECD countries in our sample.

ANDHAY is from Anderson and Hayami 1986. The data are the nominal protection rates for 1980. The data are for 12 countries in our sample.

The following variables were created as combinations of the above variables.

GOVINT (for Government Intervention) is the average of TARIWEB and SCHI80. 39 countries.

GOVINT2 is the average of SCHI80 and TARIFF. 32 countries.

GOVINT3 is the average of SCHI80 and ANDHAY. 27 countries.

(AHTARIFF is TARIFF, supplemented by ANDHAY in cases where TARIFF is missing. 19 countries.)

GOVINT4 is SCHI80, supplemented by AHTARIFF in cases where SCHI80 is missing. 34 countries.

GOVINT5 is GOVINT4, supplemented by TARIWEB in cases where GOVINT4 is missing. 42 countries.

Table A3. Mineral Share and Density

Country	Mineral Share*	Dens1	Dens3	Area	Population	Arable Land	Pastures
Angola	0.50	-0.71	-0.67	123.90	6.20	3.50	29.00
Burundi	0.50	0.74	-0.07	2.60	3.90	1.25	0.80
Cameroon	0.30	-0.60	-0.56	47.20	7.50	6.28	8.30
Chad	0.70	-0.73	-0.72	127.50	4.30	2.92	45.00
Ethiopia	0.20	-0.52	-0.54	120.80	28.80	13.73	45.70
Ghana	2.30	-0.32	-0.36	22.60	10.00	2.70	9.19
Ivory Coast	0.20	-0.55	-0.36	31.50	6.70	3.30	3.00
Kenya	0.40	-0.52	0.20	57.00	13.50	2.21	3.80
Madagascar	0.50	-0.63	-0.65	58.00	7.70	2.48	34.00
Malawi	0.00	-0.17	-0.29	8.80	5.20	2.26	1.84
Mali	0.00	-0.71	-0.67	124.00	5.80	1.80	30.00
Mozambique	0.50	-0.64	-0.66	78.30	9.20	3.08	44.00
Nigeria	32.00	-0.04	-0.29	91.20	65.70	29.90	20.72
Senegal	2.80	-0.51	-0.58	19.60	5.00	4.95	5.70
South Africa	12.10	-0.55	-0.63	122.10	25.50	13.36	82.00
Somalia	6.30	-0.71	-0.71	63.60	3.20	1.06	28.85
Sudan	0.30	-0.70	-0.65	250.50	16.00	12.06	56.00
Tanzania	0.80	-0.59	-0.57	88.90	15.40	4.99	35.00
Uganda	0.70	-0.19	-0.34	20.00	11.30	5.26	5.00
Zaire	14.90	-0.66	-0.09	232.20	24.50	6.10	9.22
Zimbabwe	6.90	-0.60	-0.40	38.60	6.20	2.52	4.86
Aafghanistan	1.10	-0.46	-0.60	64.80	19.30	8.05	50.00
Bangladesh	0.50	4.57	1.62	14.40	76.60	9.13	0.60
Burma	0.90	-0.30	0.14	67.70	31.20	9.97	0.36
India	1.20	1.17	0.28	320.40	618.70	167.23	12.78
Indonesia	17.40	-0.05	0.80	191.90	135.90	19.39	12.30
Korea	1.60	2.78	3.77	9.82	34.70	2.24	0.03
Malaysia	7.30	-0.40	0.08	32.90	12.00	4.15	0.03
Nepal	0.10	0.14	0.39	14.10	12.70	2.33	1.79
Pakistan	0.70	0.14	0.17	77.87	70.30	19.56	5.00
Papua N.G.	11.50	-0.70	1.23	45.17	2.72	0.35	0.10
Philippines	2.20	0.70	0.50	30.00	43.80	9.74	0.83
Sri Lanka	1.30	1.30	1.05	18.50	7.40	6.03	8.49
Thailand	1.70	0.05	-0.03	51.40	41.40	16.36	0.31
Argentina	1.60	-0.67	-0.70	278.90	25.40	34.40	143.80
Bolivia	12.10	-0.72	-0.68	109.90	4.90	3.22	27.20
Brazil	1.10	-0.63	-0.53	851.30	109.70	57.83	152.00
Chile	6.30	-0.63	-0.49	75.70	10.20	5.18	11.60
Colombia	1.40	-0.53	-0.42	103.90	23.80	5.25	30.00
Costa Rica	0.50	-0.37	-0.30	5.10	2.00	0.49	1.56
Dominican Rep.	2.80	0.32	0.04	4.80	5.20	1.18	1.45
Ecuador	11.10	-0.52	-0.25	28.40	6.90	2.61	2.56
El Salvador	0.20	1.19	0.50	2.10	4.10	0.65	0.61

Table A3. Mineral Share and Density

(Continued)

Country	Mineral Share*	Dens1	Dens3	Area	Population	Arable Land	Pastures
Guatemala	0.40	-0.19	0.08	10.80	6.20	1.70	0.90
Haiti	0.50	1.10	0.57	2.80	5.20	0.85	0.59
Honduras	2.40	-0.48	-0.49	11.20	3.10	1.60	3.40
Mexico	1.20	-0.46	-0.48	197.30	59.20	23.19	74.50
Nicaragua	0.40	-0.57	-0.56	12.10	2.30	1.50	3.38
Paraguay	0.20	-0.70	-0.68	40.70	2.60	1.10	15.00
Peru	6.00	-0.64	-0.50	128.50	15.50	3.19	27.12
Uruguay	0.50	-0.60	-0.67	17.80	2.80	1.86	13.60
Venezuela	24.90	-0.62	-0.46	88.20	12.70	3.57	16.73
Algeria	27.70	-0.69	-0.59	237.80	15.70	7.17	37.17
Egypt	0.50	-0.39	3.06	99.10	36.90	2.84	0.00
Iran	35.30	-0.56	-0.51	164.80	32.70	15.86	44 .00
Iraq	49.60	-0.51	-0.32	43.50	11.00	5.28	4 .00
Morocco	6.30	-0.37	-0.40	44.40	17.30	7.63	12 .50
Syria	8.50	-0.36	-0.56	6.60	13.60	1.98	0.44
Tunisia	8.60	-0.42	-0.50	16.30	5.60	4.78	2.55
Turkey	1.60	-0.24	-0.41	76.90	40.10	27.93	10.40
Australia	3.40	-0.74	-0.75	761.79	13.51	42.30	458.20
Austria	0.60	0.15	0.05	8.27	7.52	1.61	2.18
Belgium	0.80	2.23	1.46	3.28	9.80	0.90	0.80
Canada	3.60	-0.74	-0.65	922.11	22.80	43.02	23.25
Denmark	0.10	0.44	-0.23	4.24	5.06	2.66	0.28
Finland	0.50	-0.61	-0.67	30.55	4.71	2.50	23.00
France	0.80	0.21	-0.16	54.58	52.80	18.89	13.56
Germany,F.R.	1.20	1.78	1.04	24.41	61.80	7.59	4.94
Greece	1.40	-0.07	-0.36	13.08	9.05	3.89	5.25
Ireland	0.50	-0.31	-0.49	6.89	3.13	1.02	4.67
Israel	0.50	0.91	0.47	2.10	3.50	0.43	0.82
Italy	0.50	1.14	0.34	29.41	55.80	12.29	5.21
Japan	0.70	2.25	5.34	37.10	111.60	5.16	0.46
Netherlands	0.30	3.28	1.97	3.38	13.65	0.84	1.26
Norway	2.40	-0.63	-0.53	30.78	4.01	0.79	8.33
New Zealand	0.50	-0.65	-0.64	26.87	3.07	0.40	13.08
Portugal	0.60	0.27	-0.06	9.16	9.43	3.64	0.53
Spain	1.30	-0.05	-0.37	49.98	35.60	20.89	11.19
Sweden	0.80	-0.56	-0.05	41.15	8.20	3.02	0.72
Switzerland	0.50	0.85	0.80	3.98	6.41	0.39	1.63
U.K.	1.50	1.56	0.51	24.18	56.00	7.15	11.48
U.S.A.	2.80	-0.53	-0.57	912.68	213.60	188.22	241.90

* Mineral share for period 1970-1977

OBS	CY	WDRIND	KRUEGER	WEBB	TARIWEB	SCHI80	SCHI7981	TARIFF	ANDHAY	GOVINT	GOVINT2	GOVINT3
1	Angola	2	.	.	.	.	.	.	.	.	.	.
2	Burundi	4	.	.	.	.	.	.	.	.	.	.
3	Cameroon	19	.	.	.	.	.	.	.	.	.	.
4	Chad	104	.	.	.	.	.	.	.	.	.	.
5	Ethiopia	30	.	.	.	.	.	.	.	.	.	.
6	Ghana	33	.	.	.	.	.	.	.	.	.	.
7	Ivory	18	-0.396	.	.	-0.24410	-0.22451	.	.	-0.24410	-0.24410	-0.24410
8	Kenya	55	.	-0.005	-0.00498	.	.	.	.	-0.00498	.	.
9	Madagasc	67	.	.	.	.	.	.	.	.	.	.
10	Malawi	75	.	.	.	.	.	.	.	.	.	.
11	Mali	70	.	.	.	.	.	.	.	.	.	.
12	Mozambiq	72	.	.	.	.	.	.	.	.	.	.
13	Nigeria	78	.	0.285	0.39860	.	.	.	.	0.39860	.	.
14	Senegal	96	.	0.034	0.03520	.	.	.	.	0.03520	.	.
15	SouthAf	119	.	0.075	0.08108	.	.	.	.	0.08108	.	.
16	Somalia	100	.	.	.	.	.	.	.	.	.	.
17	Sudan	95	.	.	.	.	.	.	.	.	.	.
18	Tanzania	110	.	.	.	.	.	.	.	.	.	.
19	Uganda	111	.	.	.	.	.	.	.	.	.	.
20	Zaire	120	.	.	.	.	.	.	.	.	.	.
21	Zimbabwe	122	.	.	.	.	.	.	.	.	.	.
22	Afganist	1	.	.	.	.	.	.	.	.	.	.
23	Banglade	6	.	-0.521	-0.34254	.	.	.	.	-0.34254	.	.
24	Burma	13	.	.	.	.	.	.	.	.	.	.
25	India	47	.	-0.318	-0.24127	.	.	.	.	-0.24127	.	.
26	Indonesi	46	.	-0.075	-0.06977	.	.	.	.	-0.06977	.	.
27	Korea	57	0.908	0.566	1.30415	0.83815	0.88447	.	1.17	1.07115	0.83815	1.00407
28	Malaysia	76	-0.112	.	.	-0.16036	-0.14795	.	.	-0.16036	-0.16036	-0.16036
29	Nepal	80	.	.	.	.	.	.	.	.	.	.
30	Pakistan	84	-0.300	-0.133	-0.11739	-0.29269	-0.27294	.	.	-0.20504	-0.29269	-0.29269
31	PapuaNew	88	.	.	.	.	.	.	.	.	.	.
32	Philippi	87	-0.109	.	.	-0.20689	-0.12079	.	.	-0.20689	-0.20689	-0.20689
33	Srilanka	64	-0.193	.	.	-0.16965	-0.23378	.	.	-0.16965	-0.16965	-0.16965
34	Thailand	106	-0.177	-0.180	-0.15254	-0.21233	-0.19940	.	.	-0.18244	-0.21233	-0.21233
35	Argentin	3	-0.185	-0.338	-0.25262	-0.01608	-0.04321	.	.	-0.13435	-0.01608	-0.01608
36	Bolivia	10	.	.	.	.	.	.	.	.	.	.
37	Brazil	11	0.000	0.138	0.16009	-0.08136	-0.01850	.	.	0.03937	-0.08136	-0.08136
38	Chile	16	0.067	0.042	0.04384	0.06034	0.03735	.	.	0.05209	0.06034	0.06034
39	Colombia	21	-0.042	-0.304	-0.23313	-0.04849	-0.06652	.	.	-0.14081	-0.04849	-0.04849
40	CostaRic	23	.	.	.	.	.	.	.	.	.	.
41	DomRep	25	-0.166	.	.	-0.15418	-0.16555	.	.	-0.15418	-0.15418	-0.15418
42	Ecuador	27	.	.	.	.	.	.	.	.	.	.
43	ElSal	99	.	.	.	.	.	.	.	.	.	.
44	Guatemal	39	.	.	.	.	.	.	.	.	.	.
45	Haiti	43	.	.	.	.	.	.	.	.	.	.
46	Honduras	42	.	.	.	.	.	.	.	.	.	.
47	Mexico	69	.	0.034	0.03520	.	.	.	.	0.03520	.	.
48	Nicaragu	79	.	.	.	.	.	.	.	.	.	.
49	Paraguay	91	.	.	.	.	.	.	.	.	.	.
50	Peru	86	.	.	.	.	.	.	.	.	.	.
51	Uruguay	112	.	.	.	.	.	.	.	.	.	.
52	VENEZUEL	113	.	.	.	.	.	.	.	.	.	.
53	Algeria	26	.	.	.	.	.	.	.	.	.	.
54	Egypt	28	-0.236	-0.085	-0.07834	-0.43314	-0.41464	.	.	-0.25574	-0.43314	-0.43314
55	Iran	48	.	.	.	.	.	.	.	.	.	.
56	Iraq	49	.	.	.	.	.	.	.	.	.	.

OBS	CY	WDRIND	KRUEGER	WEBB	TARIWEB	SCHI80	SCHI7981	TARIFF	ANDHAY	GOVINT	GOVINT2	GOVINT3
57	Morocco	66	-0.054	.	.	-0.16853	-0.09771	.	.	-0.16853	-0.16853	-0.16853
58	Syria	103	.	.	.	.	.	.	.	.	.	.
59	Tunisia	108	.	.	.	.	.	.	.	.	.	.
60	Turkey	109	0.073	-0.238	-0.19225	0.01716	0.01254	.	.	-0.08754	0.01716	0.01716
61	AUSTRALI	916	.	0.047	0.04932	.	.	0.025	-0.02	0.04932	0.02500	-0.02000
62	AUSTRIA	903	.	.	.	.	.	0.486	.	.	0.48600	.
63	BELGIUM	904	.	0.261	0.35318	.	.	0.422	.	0.35318	0.42200	.
64	CANADA	901	.	0.162	0.19332	.	.	0.104	.	0.19332	0.10400	.
65	DENMARK	905	.	0.261	0.35318	.	.	0.422	0.25	0.35318	0.42200	0.25000
66	FINLAND	906	.	.	.	.	.	.	.	.	.	.
67	FRANCE	907	.	0.261	0.35318	.	.	0.422	0.30	0.35318	0.42200	0.30000
68	GERMANY	908	.	0.261	0.35318	.	.	0.422	0.44	0.35318	0.42200	0.44000
69	Greece	37	.	.	.	.	.	.	.	.	.	.
70	IRELAND	909	.	0.261	0.35318	.	.	0.422	.	0.35318	0.42200	.
71	Israel	51	.	.	.	.	.	.	.	.	.	.
72	ITALY	910	.	0.261	0.35318	.	.	0.422	0.57	0.35318	0.42200	0.57000
73	Japan	54	.	0.509	1.03666	.	.	0.789	0.85	1.03666	0.78900	0.85000
74	NETHER	911	.	0.261	0.35318	.	.	0.422	0.27	0.35318	0.42200	0.27000
75	NORWAY	912	.	0.261	0.35318	.	.	0.422	.	0.35318	0.42200	.
76	NEWZEALA	81	.	0.174	0.21065	.	.	0.042	0.02	0.21065	0.04200	0.02000
77	Portugal	90	0.078	.	.	0.06263	0.05254	.	.	0.06263	0.06263	0.06263
78	Spain	29	.	0.261	0.35318	.	.	0.422	.	0.35318	0.42200	.
79	SWEDEN	913	.	.	.	.	.	.	0.59	.	.	0.59000
80	SWITZ	914	.	.	.	.	.	.	1.26	.	.	1.26000
81	UK	915	.	0.261	0.35318	.	.	0.422	0.35	0.35318	0.42200	0.35000
82	USA	902	.	0.082	0.08932	.	.	0.093	.	0.08932	0.09300	.

OBS	CY	WDRIND	TARIWEB	SCHI80	TARIFF	ANDHAY	AHTARIF	GOVINT4	GOVINT5
1	Angola	2	.	.	.	.	.	.	.
2	Burundi	4	.	.	.	.	.	.	.
3	Cameroon	19	.	.	.	.	.	.	.
4	Chad	104	.	.	.	.	.	.	.
5	Ethiopia	30	.	.	.	.	.	.	.
6	Ghana	33	.	.	.	.	.	.	.
7	Ivory	18	.	-0.24410	.	.	.	-0.24410	-0.24410
8	Kenya	55	-0.00498	.	.	.	.	.	-0.00498
9	Madagasc	67	.	.	.	.	.	.	.
10	Malawi	75	.	.	.	.	.	.	.
11	Mali	70	.	.	.	.	.	.	.
12	Mozambiq	72	.	.	.	.	.	.	.
13	Nigeria	78	0.39860	.	.	.	.	.	0.39860
14	Senegal	96	0.03520	.	.	.	.	.	0.03520
15	SouthAf	119	0.08108	.	.	.	.	.	0.08108
16	Somalia	100	.	.	.	.	.	.	.
17	Sudan	95	.	.	.	.	.	.	.
18	Tanzania	110	.	.	.	.	.	.	.
19	Uganda	111	.	.	.	.	.	.	.
20	Zaire	120	.	.	.	.	.	.	.
21	Zimbabwe	122	.	.	.	.	.	.	.
22	Afganist	1	.	.	.	.	.	.	.
23	Banglade	6	-0.34254	.	.	.	.	.	-0.34254
24	Burma	13	.	.	.	.	.	.	.
25	India	47	-0.24127	.	.	.	.	.	-0.24127
26	Indonesi	46	-0.06977	.	.	.	.	.	-0.06977
27	Korea	57	1.30415	0.83815	.	1.17	1.17	0.83815	0.83815
28	Malaysia	76	.	-0.16036	.	.	.	-0.16036	-0.16036
29	Nepal	80	.	.	.	.	.	.	.
30	Pakistan	84	-0.11739	-0.29269	.	.	.	-0.29269	-0.29269
31	PapuaNew	88	.	.	.	.	.	.	.
32	Philippi	87	.	-0.20689	.	.	.	-0.20689	-0.20689
33	Srilanka	64	.	-0.16965	.	.	.	-0.16965	-0.16965
34	Thailand	106	-0.15254	-0.21233	.	.	.	-0.21233	-0.21233
35	Argentin	3	-0.25262	-0.01608	.	.	.	-0.01608	-0.01608
36	Bolivia	10	.	.	.	.	.	.	.
37	Brazil	11	0.16009	-0.08136	.	.	.	-0.08136	-0.08136
38	Chile	16	0.04384	0.06034	.	.	.	0.06034	0.06034
39	Colombia	21	-0.23313	-0.04849	.	.	.	-0.04849	-0.04849
40	CostaRic	23	.	.	.	.	.	.	.
41	DomRep	25	.	-0.15418	.	.	.	-0.15418	-0.15418
42	Ecuador	27	.	.	.	.	.	.	.
43	ElSal	99	.	.	.	.	.	.	.
44	Guatemal	39	.	.	.	.	.	.	.
45	Haiti	43	.	.	.	.	.	.	.
46	Honduras	42	.	.	.	.	.	.	.
47	Mexico	69	0.03520	.	.	.	.	.	0.03520
48	Nicaragu	79	.	.	.	.	.	.	.
49	Paraguay	91	.	.	.	.	.	.	.
50	Peru	86	.	.	.	.	.	.	.
51	Uruguay	112	.	.	.	.	.	.	.
52	VENEZUEL	113	.	.	.	.	.	.	.
53	Algeria	26	.	.	.	.	.	.	.
54	Egypt	28	-0.07834	-0.43314	.	.	.	-0.43314	-0.43314
55	Iran	48	.	.	.	.	.	.	.
56	Iraq	49	.	.	.	.	.	.	.

OBS	CY	WDRIND	TARIWEB	SCHI80	TARIFF	ANDHAY	AHTARIF	GOVINT4	GOVINT5
57	Morocco	66	.	-0.16853	.	.	.	-0.16853	-0.16853
58	Syria	103	.	.	.	.	.	.	.
59	Tunisia	108	.	.	.	.	.	.	.
60	Turkey	109	-0.19225	0.01716	.	.	.	0.01716	0.01716
61	AUSTRALI	916	0.04932	.	0.025	-0.02	0.025	0.02500	0.02500
62	AUSTRIA	903	.	.	0.486	.	0.486	0.48600	0.48600
63	BELGIUM	904	0.35318	.	0.422	.	0.422	0.42200	0.42200
64	CANADA	901	0.19332	.	0.104	.	0.104	0.10400	0.10400
65	DENMARK	905	0.35318	.	0.422	0.25	0.422	0.42200	0.42200
66	FINLAND	906	.	.	.	.	.	.	.
67	FRANCE	907	0.35318	.	0.422	0.30	0.422	0.42200	0.42200
68	GERMANY	908	0.35318	.	0.422	0.44	0.422	0.42200	0.42200
69	Greece	37	.	.	.	.	.	.	.
70	IRELAND	909	0.35318	.	0.422	.	0.422	0.42200	0.42200
71	Israel	51	.	.	.	.	.	.	.
72	ITALY	910	0.35318	.	0.422	0.57	0.422	0.42200	0.42200
73	Japan	54	1.03666	.	0.789	0.85	0.789	0.78900	0.78900
74	NETHER	911	0.35318	.	0.422	0.27	0.422	0.42200	0.42200
75	NORWAY	912	0.35318	.	0.422	.	0.422	0.42200	0.42200
76	NEWZEALA	81	0.21065	.	0.042	0.02	0.042	0.04200	0.04200
77	Portugal	90	.	0.06263	.	.	.	0.06263	0.06263
78	Spain	29	0.35318	.	0.422	.	0.422	0.42200	0.42200
79	SWEDEN	913	.	.	.	0.59	0.590	0.59000	0.59000
80	SWITZ	914	.	.	.	1.26	1.260	1.26000	1.26000
81	UK	915	0.35318	.	0.422	0.35	0.422	0.42200	0.42200
82	USA	902	0.08932	.	0.093	.	0.093	0.09300	0.09300

OBS	CY	WDRIND	APL80	APN80	RELY80	MINS7081	DENS3
1	Afganist	1	0.0075	0.007239	0.0522	0.00500	-0.60
2	Algeria	26	0.0158	0.004356	0.1752	0.27400	-0.59
3	Angola	2	0.0029	.	0.0609	0.18400	-0.67
4	Argentin	3	0.0090	0.008970	0.3808	0.01700	-0.70
5	AUSTRALI	916	0.0070	0.006935	0.7321	0.04600	-0.75
6	AUSTRIA	903	0.0104	0.010400	0.7217	0.00500	0.05
7	Banglade	6	0.0063	0.002967	0.0473	0.00500	1.62
8	BELGIUM	904	0.0104	0.010400	0.8092	0.00700	1.46
9	Bolivia	10	0.0087	0.007131	0.1341	0.10100	-0.68
10	Brazil	11	0.0055	0.005393	0.2943	0.00500	-0.53
11	Burma	13	0.0052	0.000931	0.0424	0.01000	0.14
12	Burundi	4	0.0116	0.009849	0.0292	0.00400	-0.07
13	Cameroon	19	0.0095	0.009707	0.0767	0.02300	-0.56
14	CANADA	901	0.0080	0.008000	0.9937	0.04300	-0.65
15	Chad	104	0.0088	0.008992	0.0310	0.00600	-0.72
16	Chile	16	0.0099	0.009348	0.3745	0.07700	-0.49
17	Colombia	21	0.0086	0.008503	0.2238	0.01600	-0.42
18	CostaRic	23	0.0099	0.009948	0.2657	0.00500	-0.30
19	DENMARK	905	0.0100	0.010195	0.8417	0.00200	-0.23
20	DomRep	25	0.0074	0.005401	0.1638	0.03300	0.04
21	Ecuador	27	0.0069	0.006106	0.2286	0.15100	-0.25
22	Egypt	28	0.0064	0.006316	0.0872	0.00500	3.06
23	ElSal	99	0.0098	0.004900	0.1236	0.00100	0.50
24	Ethiopia	30	0.0069	0.004959	0.0285	0.00200	-0.54
25	FINLAND	906	0.0142	0.014387	0.7360	0.00400	-0.67
26	FRANCE	907	0.0109	0.010586	0.8495	0.00800	-0.16
27	GERMANY	908	0.0113	0.011294	0.8589	0.01000	1.04
28	Ghana	33	0.0404	0.010000	0.0369	0.00900	-0.36
29	Greece	37	0.0115	0.010705	0.3843	0.01500	-0.36
30	Guatemal	39	0.0080	0.006557	0.1712	0.00100	0.08
31	Haiti	43	0.0078	0.007800	0.0611	0.00500	0.57
32	Honduras	42	0.0053	.	0.0942	0.02300	-0.49
33	India	47	0.0069	0.006553	0.0539	0.01500	0.28
34	Indonesi	46	0.0091	0.008940	0.0932	0.21400	0.80
35	Iran	48	0.0151	0.005718	0.2582	0.35300	-0.51
36	Iraq	49	0.0072	0.005225	0.3865	0.49600	-0.32
37	IRELAND	909	0.0088	0.008808	0.4322	0.03300	-0.49
38	Israel	51	0.0086	0.008544	0.5388	0.00500	0.47
39	ITALY	910	0.0111	0.011094	0.6282	0.00600	0.34
40	Ivory	18	0.0066	0.006744	0.0974	0.00300	-0.36
41	Japan	54	0.0216	0.021600	0.7118	0.00600	5.34
42	Kenya	55	0.0072	0.005906	0.0580	0.00300	0.20
43	Korea	57	0.0160	0.014484	0.2077	0.01300	3.77
44	Madagasc	67	0.0071	0.006050	0.0516	0.03400	-0.65
45	Malawi	75	0.0047	0.002419	0.0366	0.00001	-0.29
46	Malaysia	76	0.0128	0.012800	0.2729	0.07200	0.08
47	Mali	70	0.0068	0.006465	0.0312	0.00500	-0.67
48	Mexico	69	0.0087	0.008432	0.3800	0.04700	-0.48
49	Morocco	66	0.0152	0.015306	0.1051	0.05300	-0.40
50	Mozambiq	72	0.0054	0.002233	0.0559	0.00600	-0.66
51	Nepal	80	0.0065	0.007584	0.0430	0.00500	0.39
52	NETHER	911	0.0102	0.010248	0.7924	0.00200	1.97
53	Nicaragu	79	0.0094	0.004933	0.1765	0.00700	-0.56
54	Nigeria	78	0.0182	0.010568	0.0722	0.25000	-0.29
55	NORWAY	912	0.0157	0.016104	0.9728	0.07400	-0.53
56	NEWZEALA	81	0.0051	0.005090	0.6456	0.00700	-0.64

OBS	CY	WDRIND	APL80	APN80	RELY80	MINS7081	DENS3
57	Pakistan	84	0.0066	0.005186	0.0867	0.009	0.17
58	PapuaNew	88	0.0148	0.011435	0.1340	0.121	1.23
59	Paraguay	91	0.0073	0.007241	0.1736	0.003	-0.68
60	Peru	86	0.0081	0.008104	0.2196	0.099	-0.50
61	Philippi	87	0.0063	0.006099	0.1360	0.024	0.50
62	Portugal	90	0.0118	0.011612	0.3724	0.006	-0.06
63	Senegal	96	0.0061	0.006233	0.0653	0.005	-0.58
64	SouthAf	119	0.0079	0.010297	0.3759	0.116	-0.63
65	Somalia	100	0.0115	0.007270	0.0364	0.007	-0.71
66	Spain	29	0.0095	0.009518	0.5376	0.015	-0.37
67	SriLanka	64	0.0072	0.006612	0.1051	0.018	1.05
68	Sudan	95	0.0104	0.006047	0.0571	0.002	-0.65
69	SWEDEN	913	0.0115	0.010933	0.7772	0.006	-0.05
70	SWITZ	914	0.0170	0.016847	0.8780	0.005	0.80
71	Syria	103	0.0091	0.006757	0.2693	0.005	-0.56
72	Tanzania	110	0.0064	0.001976	0.0310	0.006	-0.57
73	Thailand	106	0.0055	0.005789	0.1485	0.019	-0.03
74	Tunisia	108	0.0090	0.007714	0.1618	0.105	-0.50
75	Turkey	109	0.0101	0.008709	0.2034	0.019	-0.41
76	Uganda	111	0.0156	0.001534	0.0225	0.007	-0.34
77	UK	915	0.0102	0.010219	0.6993	0.032	0.51
78	Uruguay	112	0.0058	0.005841	0.3948	0.008	-0.67
79	USA	902	0.0073	0.007300	1.0000	0.028	-0.57
80	VENEZUEL	113	0.0107	0.010700	0.3879	0.226	-0.46
81	Zaire	120	0.0325	0.014083	0.0197	0.171	-0.09
82	Zimbabwe	122	0.0069	0.003747	0.0628	0.069	-0.40